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Editor's Note

The Institute grounds are bursting with signs of the warm days ahead. The talented gardeners have been busily attending to the Gifford Garden; showy peony and rhododendron blooms are testimony to their efforts. The bees are buzzing and the bats are clicking; in this energy-drained world let's see how long we can resist making the air conditioners hum!

This year, Director Dr. Gene E. Likens delivered the University of Connecticut's graduate commencement speech. At the ceremony, he received an honorary degree for his pioneering work on human-induced environmental change. The transcript of his speech is available on-line and encouraged reading for anyone interested in conserving our ecological heritage. Visit: http://www.ecostudies.org/Likens_UConn.html

This month's research article deals with a similar topic— how to prevent population growth from destroying the ecological systems we simultaneously depend upon and take for granted.

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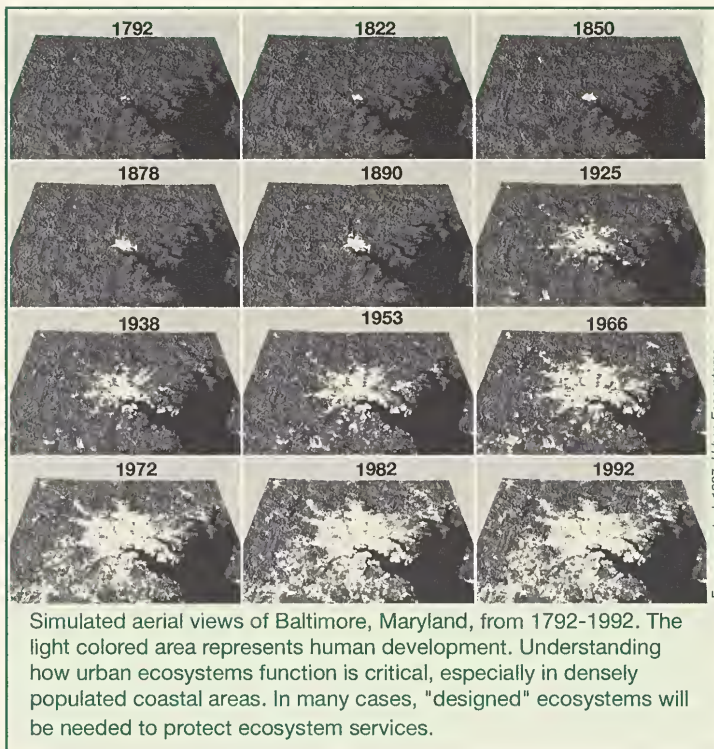
Spending the Earth's Ecological Capital

Clean drinking water, disease protection, the pollination services needed to produce the fruits and vegetables we depend on— these are just a sampling of the irreplaceable “services” performed by healthy ecosystems. As the Earth's human population increases, and consumption results in the loss of natural resources, how can we ensure that essential ecosystem services are not also lost? In a recent *Science* paper (28 May 2004), a 20-member Ecological Society of America committee, including Institute Assistant Director Dr. Michael L. Pace, addressed this question.

At the heart of their paper is the unanimous message— ecosystem services must be taken into consideration in social and political decision-making. In short, this means accounting for, and whenever possible, abating negative ecological impacts caused by development. Often unaccounted for during development cost-benefit analyses, many ecosystem services are expensive or impossible to regain once degraded.

“For too long, ecosystem services have been outside popular economic thinking. Typically, they do not enter the political decision making process until they are compromised or lost,” notes Dr. Pace. Adding, “If they were accounted for at the onset of development projects, we would be ensuring the health of ecosystems instead of cataloging their demise.”

Good science alone will not ensure the viability of Earth's ecosystem services; change in human behavior is critical. For example, research has shown that when development creates an extensive impervious surface, water quality is compromised. The scenario is simple, when you coat the soil with concrete you alter the land's ability to absorb water, increasing the intensity and concentration of runoff. Numerous studies have shown that protecting



wetlands and including greenways can minimize development's impact on water resources. It has been the norm, however, for development to proceed without these measures.

The paper also highlights the need for increasing the public's understanding of ecosystem services. Human activities, such as fossil fuel combustion and global commerce, have resulted in acid rain, global warming, and the proliferation of invasive species. Most individuals place a high priority on access to clean air, clean water, and uncontaminated food sources, yet they engage in activities that damage them. By understanding the connection between ecosystem services and the quality of human life, people can make informed choices, both economically and politically. Dr. Pace notes, “When public stakeholders, scientists, and policy-makers are all engaged, thoughtful decisions can be made about how to best manage ecosystem services.”

While fostering connections with the public and policy makers, ecologists need to continue expanding our understanding of how ecosystems provide services. In order to prioritize research, conservation, and restoration efforts, we must identify irreplaceable ecosystem services, the habitats that support them, and the causal agents that degrade them. It is estimated that over half the Earth's population will be

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On the Trails of IES: A Volunteer Profile

by Lori Quillen

There have been numerous articles written about how the pace of everyday life has escalated. In spite of all the technological advances meant to make life easier, from cell phones to microwave ovens, on average Americans work longer than their counterparts did in the 1950's. In this fast-paced world, most of us can agree that time is one of our most precious resources.

By giving the gift of time, IES volunteers enrich the Institute's ability to fulfill its mission—the creation, application, and dissemination of ecological knowledge. From organizing archives, to potting greenhouse plants and pruning the gardens, they are an indispensable part of the Institute. Currently, 144 individuals participate in the Institute's Volunteer Program, which is coordinated by Ms. Susan Eberth.

On a balmy afternoon in May, I conducted an interview with one of them—Mr. Barry Haydasz. He had just returned from hiking the Institute's trails, and had both a camera full of IES wildflowers and a lingering dog tick to show for it. After disposing of the tick, and gazing at the images, we moved on to the interview.

How did you discover IES?

The Institute and I are both residents of Dutchess County. I first interacted with the site during family outings, when the property was still called the Cary Arboretum. I "rediscovered" the Institute when my interest in natural history was rekindled.

As a child I was very engaged in the natural world, but my adult life took me in a different direction—the technology industry. Although I lived on a 500-acre farm in Stormville, NY, I interacted very little with the environment

around me. Several years ago, a good friend encouraged me to take a trip to Costa Rica. After being immersed in their flora and fauna, I came home with a reinvigorated appreciation for the natural world.

What made your trip to Costa Rica so pivotal?

I've always had a fondness for moths and butterflies. My trip was eco-tourism based; the first thing I encountered was an illuminated bed sheet covered in moths as big as my hand. Standing next the sheet was a world-traveling lepidopterist who would become my companion for the next ten days. For the first time, I had a mentor that was eager to share a wealth of butterfly knowledge with me. When I returned home, I found myself looking at the landscape differently. I wanted to know more about the birds, plants, and insects that had always been living right in my backyard.



A monarch butterfly feeding on a butterfly bush. Eastern monarchs are long-distance migrators; many populations overwinter in Mexico.

How did you become an IES volunteer?

With my interest in natural history sparked again, I became involved in the North American Butterfly Association's Fourth of July Butterfly Count. For a number of years, I conducted the count on the Stormville farm, but when it was sold I needed to find another Dutchess County location. With its trails, internal roads, gardens, and fields, the Institute provided an excellent venue for observing butterflies.

When I arrived at the Institute, I went to the Gifford House Visitor and Education Center to get a parking permit. Visitor Services Coordinator Ms. Luanne Panarotti saw me dressed in my field gear and inquired if I was interested in being a new trail monitor. I replied that if an opening existed, I'd love to do the job! She promptly sent me to speak



A yellow-collared scape moth on a goldenrod. Active during the day, scape moths are commonly called wasp moths due to their orange collar and iridescent wings.

to Volunteer Coordinator Ms. Susan Eberth, and I have been serving as the Institute's trail monitor since August of 2003.

Tell me a little bit about what you have been doing?

I come to the Institute every Wednesday, rain or shine, and walk the Wappinger Creek and Cary Pines trails. When I began monitoring the trails, Ms. Panarotti mentioned the need for information on snow cover, fallen trees, and general trail conditions. Her staff conveys this information to visitors interested in hiking the trails.

My trail reports also reflect my interest in natural history, noting not only the state of the trails but also what you might encounter on them. I record every bird, butterfly, insect, mammal, and interesting plant that I encounter, and whenever possible I also take pictures.

How did the web-based trail reports originate?

Institute staff members were very enthusiastic about the flora and fauna I was observing on the trails—from native plants blooming in the Fern Glen to mushrooms covering the forest floor. When I returned from my first walk, Ms. Panarotti and Native Plant Gardener Ms. Judy Sullivan requested copies of the photos I had taken. When preparing the photos for e-mail, I realized that a website would be a great way to both archive and share my observations. Plus, it was the perfect way to combine my background in technology with my love of natural history. Each week, I generate a web-based trail report that showcases what I encountered and where I encountered it. You can view the latest reports by going to:

http://www.ecostudies.org/a/trails_&_hiking.html

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Summer Trail Highlights!

♦Butterfly activity peaks in July and August, making it the perfect time to explore the old hay fields and meadows on the Institute's trails.

♦The Fern Glen is brimming with plant life, from ferns to wildflowers. Look for columbine, blue flag, and cinnamon fern.

♦Migratory birds, such as hooded warblers and chipping sparrows, make their seasonal stop at IES. The sedge meadow is an excellent place for spotting avian activity!

What have been some highlights of your trail monitoring?

There have been so many! This past winter, I was amazed by the unique ice formations in the Wappinger Creek. The constant freezing and thawing, combined with the current, created some memorable ice sculptures. In the spring, the columbine in the Fern Glen is stunning. It is also a wonderful time to observe salamanders at the Fern Glen pond. Butterfly and bird activity peaks in the summer. Fall is a time of change; the maple trees take on their fiery color as the butterflies and bergamot slowly retreat from the old hay fields.

What have you gained from your volunteer experience?

I have a deep respect for IES. The staff is working to understand the natural world, not develop it or exploit it. First and foremost, the Institute has given me support and validation for my interest in natural history. When I come back from the field with a photograph of a unusual moth or an ephemeral spring plant, my Institute contacts are as excited as I am! It is very rewarding to see that the information I gather is both useful and appreciated.

The trail reports have given me an outlet to meld my college biology training, technology experience, and passion for natural history. I just finished creating an Oracle database that helps me generate reports on the flora and fauna groups I have observed. For instance, I can create a report on all the butterflies I've encountered at IES since August 2003.

What do you hope to do next?

I hope to continue developing ways to catalog natural history records and share my IES trail insights. My trail reports are currently being used to enhance trail information, such as the newly revised Wappinger Creek Winter Trail Guide, which will be available on-line later this fall. In the future, it would be great to increase on-trail interpretation in areas that have unique attributes, such as migratory bird activity or native wild flowers. ●



Lori M. Quillen

The Gifford Garden
Stop by and see what's blooming!

Student Scientist Honored



Lori M. Quillen

Institute Director Dr. Gene E. Likens presented Miss Kaitlyn Lafferty with her award.

This year the Institute awarded the "Best Project in Environmental Science and Ecology" to Kaitlyn Lafferty for her project, "Particulate Matter (PM): How does it effect our environment?" Miss Lafferty is a 6th grade student at Saint Denis/Saint Columba Elementary School in Hopewell Junction, New York. Dr. Gary M. Lovett, who coordinates the Institute's team of judges for the Dutchess County Science Fair each year, noted, "Kaitlyn studied the distribution of atmospheric particulate matter in southern Dutchess County by sampling several habitat types and comparing her data to Air Quality Index data obtained from the EPA. We were very impressed with her knowledge of the subject, her careful execution of the project, and her ability to interpret the findings." The Institute has been selecting a young scientist for the "Best Project" award annually since 1991.

Notes from Down Under

Institute Director Dr. Gene E. Likens recently spent several months on sabbatical in Australia. Invited by the University of Melbourne to serve as a Miegunyah Fellow, he resided at Trinity College. Melbourne is facing serious water shortages. Professors, students, and government officials were eager to hear Dr. Likens' views on how human-induced environmental change impacts this essential resource. To get his message out, Dr. Likens gave lectures, held a mini undergraduate course, visited field sites, and had one-on-one meetings with decision makers such as Australian Governor John Landy. In addition to the Miegunyah lecture, Dr. Likens spoke at the Australia Research Centre for Urban Ecology, Trinity College's Botany School, the Royal Botanical Gardens, the Australian Institute of International Affairs, and the Cooperative Research Centre for Freshwater Ecology. His lectures received press coverage in outlets ranging from the *Canberra Times* to the *Herald Sun*. Dr. Likens found the experience so rewarding that he will be heading back to Australia in December to give a keynote lecture on global sustainability at the University of Melbourne.

Spending, *continued from page 1*

living in urban areas by 2030. In light of this, there is an urgent need for innovative ecological solutions to the consequences of urbanization, such as freshwater degradation and the concentration of urban waste.

When ecosystem service conservation is not possible, ecologists need to design sustainable solutions. Based on fundamental ecological knowledge, designed systems differ from restored systems—they are meant to minimize negative conditions, not replicate historical structure. Many coastal areas have poor water quality and compromised fisheries due to degraded upland habitats. In areas where restoration is not possible due to extensive development, designed systems could help improve coastal water quality. For designed systems to succeed, land managers, government

agencies, and researchers will need to be actively involved in both constructing and promoting them.

While humans are not the only animals that modify their environment, the scope of their modifications exceeds that of other animals. Beavers construct dams; humans construct urban centers like New York City. While it is unlikely that humans will stop altering the world around them, putting more emphasis on *how* we modify the environment, with an eye toward maintaining ecosystem services, is both possible and essential. By incorporating ecosystem services in the public and policy discourse, and providing access to sound ecological management practices, essential ecosystem services will be protected for future generations. ●

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Newsletter

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Calendar

CONTINUING EDUCATION

The Continuing Education Program is now accepting summer registrations. For information, or to request a brochure, call 845-677-9643 or visit www.ecostudies.org/cep.html. Summer semester programs include:

Biology

July 11 (1 Sun.): **Summer Wild Plant Identification**
July 24 (1 Sat.): **Summer Tree Identification**

Gardening

July 10 (1 Sat.): **Field Course: The Lazy Gardener-Low Impact Gardening**
July 17 (1 Sat.): **Mixed Border Design**
July 24 (1 Sat.): **Running Tapestries: Perennial and Annual Ground Covers**
July 31 (1 Sat.): **Wetland Plants for Gardens**
July 31 (1 Sat.): **Designing Gardens with Form and Texture**

Botanical Illustration

July 10 (1 Sat.): **Quick Color Botanical Sketching**
July 11 (1 Sun.): **Color Pencil Drawing in the Garden**
July 11 (1 Sun.): **Gouache Painting Techniques**

GREENHOUSE

The Greenhouse is a year-round tropical plant paradise and a site for controlled environmental research. Managed using integrated pest management, plants thrive in its pesticide-free environment! The greenhouse is open daily until 3:30 p.m. with a free permit (see HOURS).

GUIDED TOURS

Guided tours of the Institute's gardens and greenhouses are available to groups for a fee. For information on fees, or to make reservations, call Luanne Panarotti at 845-677-7600 ext. 317.

IES SEMINARS

Free scientific seminars are held at 11 a.m. on Fridays in the auditorium from September until early May. The fall schedule will be available in August.

IES SUMMER ECOLOGY DAY CAMP HURRY... THERE ARE ONLY A FEW OPENINGS LEFT

For information or to register please call the Education Office from 9:00 a.m. to 4:00 p.m. at 845-677-7600 ext. 316 or visit www.ecostudies.org.



THE ECOLOGY SHOP

New items in The Ecology Shop. Organic fair-trade chocolate bars, silver jewelry hand-made in the U.S.A. Beaded animal sculpture and necklaces and many new items on the way. If you are looking for a unique gift come to The Ecology Shop. Senior Citizens Days: 10% off on Wednesdays.

HOURS

Summer Hours: April 1 - September 30

Public attractions: Mon.-Sat., 9-6, Sun. 1-6; closed public holidays. The greenhouse closes at 3:30 daily.
The Ecology Shop: Mon.-Fri., 11-5, Sat. 9-5, Sun. 1-5.
(Please note: The shop is closed Mon.-Sat. from 1-1:30.)
Free permits are required and are available at the Gifford House Visitor and Education Center until one hour before closing time.

MEMBERSHIP

Join the Institute of Ecosystem Studies. Benefits include subscription to the IES Newsletter, member's rate for courses and excursions, a 10% discount on IES Ecology Shop purchases, and participation in a reciprocal admissions program. Individual membership: \$50; family membership: \$60. Call the Development Office at 845-677-7600 ext. 120.

The Institute's Aldo Leopold Society

In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call the Development Office at 845-677-7600 ext. 120.

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65 Sharon Tpke. (Rte. 44A), Millbrook, NY 12545

... for education, general information and
The Ecology Shop:

Institute of Ecosystem Studies
Education Program
Box R, Millbrook NY 12545-0178
Tel: 845-677-5359 • Fax: 845-677-6455

The Ecology Shop: 845-677-7600 ext. 309

Street address: Gifford House Visitor and Education
Center, 181 Sharon Tpke. (Rte. 44A), Millbrook, NY 12545

... IES website: www.ecostudies.org